



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,131	01/24/2006	Jeremy John Hawkes	41577/314660	1024

23370 7590 04/07/2010

JOHN S. PRATT, ESQ
KILPATRICK STOCKTON, LLP
1100 PEACHTREE STREET
SUITE 2800
ATLANTA, GA 30309

EXAMINER

COLEMAN, RYAN L

ART UNIT	PAPER NUMBER
----------	--------------

1714

MAIL DATE	DELIVERY MODE
-----------	---------------

04/07/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,131	Applicant(s) HAWKES ET AL.	
	Examiner RYAN COLEMAN	Art Unit 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-11 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 7, 8, and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 12, 2010 has been entered. Claims 3, 6, 12, and 13 have been canceled, claims 9-11 have been withdrawn from consideration, and claims 15-17 have been added as new claims. Claims 1, 2, 4, 5, 7-11, and 14-17 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 15 specifies that the apparatus uses "only" one transducer to generate a stationary standing sound wave. Although the written description teaches embodiments in which one transducer is used to generate a

Art Unit: 1714

stationary standing sound wave (such as in Par. 0037-0040 of applicant's pre-grant publication U.S. 2006/0163166), the written description does not teach the concept that "only" one transducer is used to generate a stationary standing sound wave. Claims 16 and 17 depend from claim 15. This is a new matter rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1714

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 2, 5, 7, 8, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0069708 by Laurell et al. (hereafter referred to as "Laurell") in view of International Application Publication WO 98/50133 by Coakley et al. (hereafter referred to as "Coakley").

8. With regard to claims 1 and 15, Laurell teaches an apparatus for moving particles entrained in a first fluid to a second fluid (Par. 0001, 0134, 0135; Figure 4d). In Laurell's apparatus, a conduit with two walls (a left-hand wall and a right-hand wall when looking at Figure 4d) exists from the region where the two A-inlets and the B-inlet meet to the region where the two C-outlets and the D-outlet meet (Figure 4d). The conduit is *in communication* with the right-hand A-inlet (reads on *first inlet*) and the right-hand C-outlet (reads on *first outlet*; Par. 0134 and 0135; Figure 4d). The first fluid flows through the right-hand A-inlet and through the right-hand C-outlet (Par. 0134; Figure 4d). Both of the conduit walls are considered to comprise the B-inlet as a *second inlet* and the D-outlet as a *second outlet* because a second fluid enters the space between the two walls through the B-inlet and exits the space between the two walls through the D-outlet (Par. 0134 and 0135; Figure 4d). Laurell teaches having a means capable of generating a stationary standing sound wave pressure node in the conduit such that particles from the first fluid are moved into the second fluid (Par. 0134 and 0135), and Laurell's means for producing the standing sound wave pressure node involve having a single piezoelectric transducer generate an ultrasonic wave within the conduit such that

Art Unit: 1714

the produced wave interacts with the conduit wall opposite the transducer in order to produce a stationary standing sound wave (Par. 0072-0074). In Laurell's apparatus, since the wave interacts with the conduit wall opposite the transducer to produce a stationary standing wave, the wall opposite the transducer is considered to reflect the generated sound wave. In Laurell's apparatus, the particles in the first fluid interact with the standing wave such that they are moved from the first fluid into the second fluid (Par. 0134 and 0135; Figure 4d).

9. As discussed above, in Laurell's apparatus, one of the conduit walls (applicant's *second wall*) functions to reflect the generated sound wave such that a standing wave is produced within the conduit, but Laurell does not specifically teach that the other wall (applicant's *first wall*) can be considered to generate and transmit the sound wave.

10. Coakley teaches an apparatus for using stationary standing acoustic wave nodes to move suspended particles within a liquid flowing through a conduit (Abstract; Page 4, line 5 to Page 5, line 18; Figure 1). Coakley teaches that the transducer used to generate the standing wave can be appropriately positioned in the apparatus by having a recess in an outer surface of a conduit wall and positioning the transducer (item 20 in Figure 1) within the recess (Page 4, 5-33; Figure 1). In such a system, the wall with the recess is considered to generate and transmit the sound wave because the transducer is positioned within a recess of the wall.

11. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Laurell such that the transducer that generates and transmits the sound wave is positioned within a recess formed in the outer surface of

Art Unit: 1714

the conduit wall that is opposite the wall that reflects the sound wave. The motivation for performing the modification was provided by Coakley, who teaches that a transducer positioned within such a recess could advantageously function to generate and transmit a standing sound wave that can move suspended particles within fluid. In the apparatus of Laurell in view of Coakley, the wall with the recess would be considered to generate and transmit the sound wave because the transducer would be positioned within the wall's recess.

12. With regard to claim 2, in the apparatus of Laurell in view of Coakley, the apparatus is considered to be capable of providing contacting laminar flow of the each fluid such that mixing is minimized because Laurell teaches that the small scale of the conduit produces laminar liquid flow such that the liquids do not blend (Par. 0029 and 0134 of Laurell).

13. With regard to claim 5, in the apparatus of Laurell in view of Coakley, the pressure node is considered to be centrally disposed along the longitudinal length of the conduit because Laurell uses rectangles such as rectangle 1810 in Figure 4b to indicate the placement of the ultrasonic sources (Par. 0118 and Figure 4b), and as shown in Laurell's Figure 4d, the rectangle representing the ultrasonic source is centrally disposed along the longitudinal length of the conduit.

14. With regard to claim 7, in the apparatus of Laurell in view of Coakley, the first wall of the conduit is considered to comprise a piezoceramic material because the combination teaches using a piezoceramic transducer as the transducer within the wall's recess (Par. 0099 of Laurell).

Art Unit: 1714

15. With regard to claim 8, in the apparatus of Laurell in view of Coakley, the piezoceramic transducer is associated with an alternating potential source such that a standing acoustic wave can be formed within the conduit (Par. 0082 and 0083 of Laurell).

16. With regard to claim 14, in the apparatus of Laurell in view of Coakley, the right-hand A-inlet and right-hand C-outlet are considered to communicate with the second wall because fluid that enters the conduit by way of the right-hand A-inlet and leaves the conduit by way of the right-hand C-outlet flows within space enclosed by the second wall, and the B-inlet and D-outlet are considered to communicate with the first wall because fluid that enters the conduit by way of the B-inlet and leaves the conduit by way of the D-outlet flows within space enclosed by the first wall (Figure 4d of Laurell).

17. With regard to claims 16 and 17, in the apparatus of Laurell in view of Coakley, the acoustic transducer is considered to comprise part of the first wall because, as discussed above in the rejection of claim 1, the combination teaches that transducer is positioned within a recess that is formed in the outer surface of the first wall of the conduit.

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0069708 by Laurell in view of International Application Publication WO 98/50133 by Coakley as applied to claim 1 above, and further in view of U.S. Patent No. 4,743,361 to Schram.

19. With regard to claim 4, the combination of Laurell in view of Coakley does not teach that the right-hand A-inlet and the right-hand C-outlet are orthogonal to the B-inlet

Art Unit: 1714

and the D-outlet. As shown in Laurell's Figure 4d, the right-hand A-inlet and right-hand C-outlet are angled with respect to the B-inlet and D-outlet, but they are not completely orthogonal to the B-inlet and the D-outlet.

20. Schram teaches an apparatus for moving particles entrained in a first liquid to a second liquid that includes a conduit defined by a first wall with a window (item 310 in Figure 11) and a second, opposite wall with a window (item 308 in Figure 11; Col. 18, line 61 to Col. 19, line 66). The conduit is in communication with a first inlet (item 316 in Figure 11) and a first outlet (item 320 in Figure 11) for a first liquid that comes from a first container (item 324 in Figure 11). As shown in Figure 11, the first wall with window 310 comprises a second inlet (item 318 in Figure 11) and a second outlet (item 322 in Figure 11) for a second liquid (Col. 18, line 61 to Col. 19, line 58). Schram teaches using ultrasonic transducers (items 304 and 306) to generate a standing sound wave having a pressure node disposed within the conduit (Col. 18, line 61 to Col. 19, line 31; Col. 17, line 52 to Col. 18, line 28). Schram teaches that the standing wave causes particles to move from the first liquid to the second liquid (Col. 18, line 61 to Col. 19, line 31). As shown in Schram's Figure 11, the second inlet and the second outlet are orthogonal to the first inlet and the first outlet. The apparatus of Schram allows particles to be moved between two liquids while advantageously minimizing mixing between the two liquids because Schram teaches having guide vanes (item 317 in Figure 11) that ensure a parallel streamline flow of liquid through the first inlet as the second liquid enters through the second inlet (Col. 19, 12-31).

Art Unit: 1714

21. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Laurell in view of Coakley such that the right-hand A-inlet and the right-hand C-outlet are orthogonal to the B-inlet and the D-outlet (2144.04, *Rearrangement of Parts*). One of ordinary skill in the art could have used known techniques to perform the modification, and the results would have been predictable to one of ordinary skill in the art. The motivation for performing the modification was provided by Schram, who taught that when using a standing acoustic wave to move particles from a first liquid to a second liquid in a system where different inlets and outlets bring the two liquids into a region where the particles are exposed to the standing wave, the inlet and outlet for the second liquid can be orthogonal to the inlet and outlet for the first liquid such that the liquids can be advantageously brought into contact with each other without mixing.

Response to Arguments

22. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN COLEMAN whose telephone number is (571)270-7376. The examiner can normally be reached on Monday-Friday, 9-5.

Art Unit: 1714

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RLC/

Ryan L. Coleman

Patent Examiner, Art Unit 1714

April 6, 2010

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1792

Application/Control Number: 10/530,131
Art Unit: 1714

Page 11